WHAT IS CLAIMED IS:

1. An apparatus for discriminately illuminating a fluorescent sample comprising:

an image detector; and

a spatial light modulator; wherein

said spatial light modulator is coupled to said image detector; and

said image detector is capable of detecting light emitted from a fluorescent sample being excited by an excitation light modulated by said spatial light modulator; and

said spatial light modulator discriminately emits said excitation light to the fluorescent sample based on information provided from at least said image detector; and further wherein

said information comprises data including brightness levels and the spatial distribution of the light emitted by the fluorescent sample.

2. The apparatus of claim 1, wherein said image detector is at least one of a charged coupled device, a CMOS camera, a video camera, and a photodiode array.

3. The apparatus of claim 1, wherein said spatial light modulator comprises at least one of a liquid crystal display, a micro-mirror device, an array of light-emitting diodes and a fiber bundle, an array of light bulbs, and an electro-mechanical device.

4. The apparatus of claim 1, further comprising:

a memory; wherein

said memory is coupled with said image detector; and

said information is recorded within said memory, said recorded information allowing a user to recall and recurrently implement a pattern of excitation illumination on the fluorescent sample from said spatial light modulator.

5. The apparatus of claim 1, wherein an intensity of said excitation light for exciting the fluorescent sample is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample.

6. The apparatus of claim 1, wherein an intensity of said excitation light for exciting the fluorescent sample varies on a point-by-point basis based on intensities of said light emitted by the fluorescent sample.

7. The apparatus of claim 6, wherein said point-by-point basis comprises a pixel-by-pixel basis at said spatial light modulator.

8. The apparatus of claim 1, further comprising a computer for controlling said spatial light modulator through manipulation of said information.

9. The apparatus of claim 8, wherein said computer comprises a user interface allowing user manipulation of said information.

10. The apparatus of claim 1, further comprising:

a memory; wherein

said excitation light for exciting the fluorescent sample varies on a point-by-point basis based on amounts of said light emitted by the fluorescent sample; and

said excitation light is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample; where

said information is recorded within said memory, said recorded information allowing a user to recall and recurrently implement a discriminately emitted excitation light to the fluorescent sample from said spatial light modulator.

11. A method for discriminately exciting a fluorescent sample comprising:

detecting an image;

feeding light information derived from the detected image to a spatial light modulator; and

modulating spatial light based at least in part on said light information; wherein

said image is detected from emitted light released from a fluorescent sample being excited by said modulated spatial light; and

said modulated spatial light is discriminately emitted by said spatial light modulator to the fluorescent sample based at least in part on said light information; and further wherein

said light information comprises data including brightness levels and spatial distribution of the level of light emitted by the fluorescent sample.

12. The method of claim 11, wherein said image is detected with at least one of a charged coupled device, a CMOS camera, a video camera, and a photodiode array.

13. The method of claim 11, wherein said spatial light modulator comprises at least one of a liquid crystal display, a micro-mirror device, an array of light-emitting diodes and a fiber bundle, an array of light bulbs, and an electro-mechanical device.

14. The method of claim 11, further comprising:

recording said light information to a memory; wherein

after said light information is recorded within said memory, said recorded light information allows a user to recall and recurrently implement a discriminate excitation light to the fluorescent sample from said spatial light modulator.

15. The method of claim 11, wherein an intensity of said excitation light for exciting the fluorescent sample is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample.

16. The method of claim 11, wherein an intensity of said excitation light for exciting the fluorescent sample varies on a point-by-point basis based on intensities of said light emitted by the fluorescent sample.

17. The method of claim 16, wherein said point-by-point basis comprises a pixel-by-pixel basis at said spatial light modulator.

18. The method of claim 11, further comprising controlling said spatial light modulator through manipulation of said light information with a computer.

19. The method of claim 18, further comprising allowing user manipulation of said light information with said computer via a user interface.

20. The method of claim 11, further comprising:

recording said light information to a memory; wherein

after said light information is recorded within said memory, said recorded light information allows a user to recall and recurrently implement a discriminate excitation light to the fluorescent sample from said spatial light modulator; and

varying said excitation light for exciting the fluorescent sample on a point-by-point basis based on intensities of said light emitted by the fluorescent sample; where

said excitation light is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample.

21. A microscope, comprising:

the apparatus of claim 1; and

at least one objective.

22. The microscope of claim 21, wherein said image detector is at least one of a charged coupled device, a CMOS camera, a video camera, and a photodiode array.

23. The microscope of claim 21, wherein said spatial light modulator comprises at least one of a liquid crystal display, a micro-mirror device, an array of light-emitting diodes and a fiber bundle, an array of light bulbs, and an electro-mechanical device.

24. The microscope of claim 21, further comprising:

a memory; wherein

said memory is coupled with said image detector; and

said information is recorded within said memory, said recorded information allowing a user to recall and recurrently implement a discriminate excitation light to the fluorescent sample from said spatial light modulator.

25. The microscope of claim 21, wherein an intensity of said excitation light for exciting the fluorescent sample is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample.

26. The microscope of claim 21, wherein an intensity of said excitation light for exciting the fluorescent sample varies on a point-by-point basis with intensities of said light emitted by the fluorescent sample.

27. The microscope of claim 26, wherein said point-by-point basis comprises a pixel-by-pixel basis at said spatial light modulator.

28. The microscope of claim 21, further comprising a computer for controlling said spatial light modulator through manipulation of said information.

29. The microscope of claim 28, wherein said computer comprises a user interface allowing user manipulation of said information.

30. The microscope of claim 21, further comprising:

a memory; wherein

said excitation light for exciting the fluorescent sample varies on a point-by-point basis based on said light emitted by the fluorescent sample; and

said excitation light is substantially inversely proportional to an intensity of said light emitted by the fluorescent sample; where

said information is recorded within said memory, said recorded information allowing a user to recall and recurrently implement a discriminate excitation light to the fluorescent sample from said spatial light modulator.

31. A device for discriminately masking a sample being viewed, comprising:

an image detector; and

a spatial light modulator; wherein

said spatial light modulator is coupled to said image detector;

said spatial light modulator discriminately emits excitation light to the sample to thereby discriminately mask at least a portion of the sample being viewed; and

said spatial light modulator moves along the optical axis of illumination.

32. The device of claim 31, wherein said image detector comprises at least one of a charged coupled device, a CMOS camera, a video camera, and a photodiode array.

33. The device of claim 31, wherein said spatial light modulator comprises at least one of a liquid crystal display, a micro-mirror device, an array of light-emitting diodes and a fiber bundle, an array of light bulbs, and an electro-mechanical device.

34. The device of claim 31, further comprising:

a memory for recording light information; wherein

said user input comprises a graphical user interface on a computer.

35. The device of claim 34, wherein said graphical user interface allows a user to recall and recurrently implement a discriminate light to the sample from said spatial light modulator.

36. The device of claim 31, wherein an intensity of the light from said spatial light modulator varies on a point-by-point basis with light emitted by the sample being viewed.

37. The device of claim 36, wherein said point-by-point basis comprises a pixel-by-pixel basis at said spatial light modulator.

38. A computer program product for enabling a computer to discriminately excite a fluorescent sample comprising:

a computer readable medium, and software instructions, on the computer readable medium, for enabling the computer to perform predetermined operations comprising:

detecting an image;

feeding light information derived from the detected image to a spatial light modulator; and

modulating a spatial light with said spatial light modulator based at least in part on said light information; wherein

said image is detected from light released from a fluorescent sample being excited by said modulated spatial light; and

said modulated spatial light is discriminately transmitted by said spatial light modulator in at least a grayscale manner to the fluorescent sample based on said light information; and further wherein

said light information comprises information which distinguishes between variations in the level of light emitted by the fluorescent sample.

39. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said image is detected with at least one of a charged coupled device, a CMOS camera, a video camera, and a photodiode array.

40. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said spatial light modulator comprises at least one of a liquid crystal display, a micro-mirror device, an array of light-emitting diodes and a fiber bundle, an array of light bulbs, and an electro-mechanical device.

41. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said predetermined operations further comprise:

recording said light information to a memory; wherein

after said light information is recorded within said memory, said recorded light information allows a user to recall and recurrently implement a precisely discriminate excitation light to the fluorescent sample from said spatial light modulator.

42. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein an intensity of said excitation light for exciting the fluorescent sample is substantially inversely proportional to an intensity of said illumination emitted by the fluorescent sample.

43. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein an intensity of said excitation light for exciting the fluorescent sample varies on a point-by-point basis with said illumination emitted by the fluorescent sample.

44. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 43, wherein said point-by-point basis comprises a pixel-by-pixel basis at said spatial light modulator.

45. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, further wherein said predetermined operations further comprises computer readable program means for controlling said spatial light modulator through manipulation of said light information with a computer.

46. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 45, further wherein said predetermined operations further comprise allowing user manipulation of said light information with said computer via a user interface.

47. A computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, further wherein said predetermined operations comprise illuminating said fluorescent sample with epi-illumination.

48. The apparatus of claim 1, wherein said spatial light modulator emits a predetermined illuminating light pattern on said sample.

49. The apparatus of claim 1, wherein said spatial light modulator modulates based on feedback from said image detector and an operator input.

50. The apparatus of claim 1, wherein said spatial light modulator modulates based on feedback from said image detector.

51. The apparatus of claim 1, wherein said spatial light modulator moves along the optical axis of illumination.

52. The method of claim 11, further including:

emitting said spatial light in a predetermined illuminating light pattern on said sample.

53. The method of claim 11, further including:

modulating said spatial light modulator based on said light information and an operator input.

54. The method of claim 11, further including:

modulating said spatial light modulator based on said light information.

55. The method of claim 11, further wherein said spatial light modulator moves along the optical axis of illumination.

56. The microscope of claim 21, wherein said spatial light modulator emits a predetermined illuminating light pattern on said sample.

57. The microscope of claim 21, wherein said spatial light modulator modulates based on feedback from said image detector and an operator input.

58. The microscope of claim 21, wherein said spatial light modulator modulates based on feedback from said image detector.

59. The microscope of claim 21, wherein said spatial light modulator moves along the optical axis of illumination.

60. The device of claim 31, wherein said spatial light modulator emits a predetermined illuminating light pattern on said sample.

61. The device of claim 31, wherein said spatial light modulator modulates based on feedback from said image detector and an operator input.

62. The device of claim 31, wherein said spatial light modulator modulates based on feedback from said image detector.

63. The computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said modulated spatial light comprises the emission of a predetermined illuminating light pattern on said sample.

64. The computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said modulated spatial light is modulated based on said light information and an operator input.

65. The computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said modulated spatial light is modulated based on said light information.

66. The computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said spatial light modulator moves along the optical axis of illumination.

67. The apparatus of claim 1, wherein said spatial light modulator discriminately emits said excitation light in at least a grayscale manner.

68. The method of claim 11, wherein said spatial light modulator discriminately emits said excitation light in at least a grayscale manner.

69. The microscope of claim 21, wherein said spatial light modulator discriminately emits said excitation light in at least a grayscale manner.

70. The device of claim 31, wherein said spatial light modulator discriminately emits said excitation light in at least a grayscale manner.

71. The computer program product for enabling a computer to discriminately excite a fluorescent sample according to claim 38, wherein said spatial light modulator discriminately emits said excitation light in at least a grayscale manner.